

DATE: November 2, 2021

TO: Angela Parkhurst – WCR/Eau Claire

FROM: Benjamin Hartenbower – WCR/Eau Claire

SUBJECT: Technology-Based Effluent Limitations for Cady Cheese, LLC
Permit No. WI-0053597

Technology-Based Effluent Limitations (TBELs) Recommended for Outfall 005:

Parameter	Daily Maximum	Daily Minimum	Monthly Average
BOD ₅ , Total	8.4 lbs/day		3.7 lbs/day
TSS	10.5 lbs/day		4.6 lbs/day
pH	9.0 su	6.0 su	

PART 1 – BACKGROUND INFORMATION

This facility operates 6 days/week, using 559,000 to 645,000 lbs/day of raw milk to produce cheese. Additional products include whey cream and whey protein concentrate. Currently, 89,812 gallons/day of process water are discharged through Outfall 001 via land application. An estimated 29,000 gallons/day of process water is expected to be discharged to surface water through Outfall 005.

PART 2 – INDUSTRIAL CATEGORIES

Chapter NR 240, Wis. Adm. Code, specifies effluent guidelines for discharges from dairy product categories of point sources and subcategories. Cady Cheese, LLC would fall under the “Fluid Products,” “Natural and Processed Cheese,” and “Condensed Whey” subcategories as defined in s. NR 240.02, Wis. Adm. Code. These guidelines are based on federal effluent guidelines in 40 CFR Part 405 Subparts B, F and K. The permittee must meet the applicable effluent limit guidelines as described in this chapter. These effluent limit guidelines include:

- Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT) in s. NR 240.10, Wis. Adm. Code.
- Effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT) in s. NR 240.11, Wis. Adm. Code.
- If determined to be a new source, new source performance standards (NSPS) in s. NR 240.12, Wis. Adm. Code.

Section NR 220.13, Wis. Adm. Code, includes provisions that address cases where federal and state rule differ. Section 283.11, Wis. Stats., address compliance with federal standards. In this case, the state rules are consistent with federal rules with a few exceptions. In such cases, the permit will in all cases be based on the state rule notwithstanding the federal regulations. The omissions are described below.

- The state or federal rules do not specify a date for the definition for a new source. Therefore, it is necessary to review available federal guidance. The Boornazian memo (September 28, 2006) specifies a new source date for 40 CFR Part 405 Subparts A – L of May 28, 1974. The Department relies on the Boornazian memo to establish date of applicability for NSPS.
- State rules incorrectly list best available treatment (BAT) standards for BOD, TSS, and pH. BAT applies to priority pollutants and nonconventional pollutants and does not apply to BOD, TSS or pH.
- The federal standard rule lists revised BCT standards requirements. All BCT limitations are set to be the same as the best practicable control technology (BPT) standards. State rules in ch. NR 240, Wis. Adm. Code, do not list standards for BCT.

PART 3 – LEVELS OF CONTROL

All production lines have processes which construction commenced after May 28, 1974. Therefore, the process wastewater from these lines is subject to BPT, BCT, BAT and NSPS standards for the “Fluid Products,” “Natural and Processed Cheese,” and “Condensed Whey” subcategories are applicable as specified in 40 CFR Part 405 Subparts B, F, K and ch. NR 240.12, Wis. Adm. Code.

PART 4 –PRODUCTION LEVELS

The estimated levels of production for each Subcategory are provided by Cady Cheese, LLC.

Fluid Products

Process	Material Used (lbs/month)	Flow % Discharged to Surface Water	Material Used for Calculation ¹ (lbs/day)	Material Used for Calculation ² (lbs/month)
Whey Cream	14,086,800 (whey)	24.4	132,244	3,438,350

Natural and Processed Cheese

Process	Material Used (lbs/month)	Flow % Discharged to Surface Water	Material Used for Calculation ¹ (lbs/day)	Material Used for Calculation ² (lbs/month)
Cheese	15,652,000 (milk)	24.4	146,938	3,820,389

Condensed Whey

Process	Material Used (lbs/month)	Flow % Discharged to Surface Water	Material Used for Calculation ¹ (lbs/day)	Material Used for Calculation ² (lbs/month)
Whey Protein Concentrate	14,086,800 (whey)	24.4	132,244	3,438,350

Footnotes:

1. Material used for daily calculations were based on a reasonable measure of actual daily production.
2. Average monthly measure of material used was based on a 6 days/week production level.

PART 5 – BOD INPUT

The BOD₅ input is the 5-day biochemical oxygen demand of raw materials that enter the process. The current production levels in Part 4 are converted to BOD input equivalents by multiplying the amount of raw material by BOD factors specified in s. NR 240.03(1) or s. NR 240.07 Wis. Adm. Code and 40 CFR Part 405.

Fluid Products (Daily)

Process	Material Used (lbs/day)	BOD Factor ¹ (lbs/100 lbs)	Adjusted Total BOD Input (lbs/day)
Whey Cream	132,244	4.72	6,241.93
Total			6,241.93

Fluid Products (Average Monthly)

Process	Material Used (lbs/month)	BOD Factor ¹ (lbs/100 lbs)	Adjusted Total BOD Input ² (lbs/month)	Adjusted Total BOD Input ³ (lbs/day)
Whey Cream	3,438,350	4.72	162,290	5,409.67
Total				5,409.67

Natural and Processed Cheese (Daily)

Process	Material Used (lbs/day)	BOD Factor ¹ (lbs/100 lbs)	Adjusted Total BOD Input (lbs/day)
Cheese	146,938	10.39	15,266.86
Total			15,266.86

Natural and Processed Cheese (Average Monthly)

Process	Material Used (lbs/month)	BOD Factor ¹ (lbs/100 lbs)	Adjusted Total BOD Input ² (lbs/month)	Adjusted Total BOD Input ³ (lbs/day)
Cheese	3,820,389	10.39	396,938	13,231.28
Total				13,231.28

Condensed Whey (Daily)

Process	Material Used (lbs/day)	BOD Factor ¹ (lbs/100 lbs)	Adjusted Total BOD Input (lbs/day)
Whey Protein Concentrate	132,244	4.72	6,241.93
Total			6,241.93

Condensed Whey (Average Monthly)

Process	Material Used (lbs/month)	BOD Factor ¹ (lbs/100 lbs)	Adjusted Total BOD Input ² (lbs/month)	Adjusted Total BOD Input ³ (lbs/day)
Whey Protein Concentrate	3,438,350	4.72	162,290	5,409.67
Total				5,409.67

Footnotes:

1. The BOD Factors are listed in ch. NR 240.07 Wis. Adm. Code, Table 1 for generally accepted published values for protein, fat, and carbohydrate content.
2. Adjusted Total BOD input = BOD input * BOD factor / 100
3. BOD input (lbs/day) = adjusted BOD input (lbs/month) / 30 days

PART 6 – TBEL CALCULATIONS FOR FLUID PRODUCTS**pH**

Any discharge subject to BPT, BCT, or NSPS limitations or standards in this part must remain within the pH range of 6.0 to 9.0.

New Source Performance Standards (NSPS)

The production process for Whey Cream commenced construction after May 28th, 1974. Therefore, the NSPS limitations of 40 CFR Part 405.25 apply.

Total BOD Input (lbs/day)	NSPS Effluent Limitations				Calculated Limits			
	BOD (lbs/1,000 lbs)		TSS (lbs/1,000 lbs)		BOD (lbs/day) ¹		TSS (lbs/day) ¹	
	Avg	Max	Avg	Max	Avg	Max	Avg	Max
6,241.93		0.740		0.925		4.6		5.8
5,409.67	0.370		0.463		2.0		2.5	

Footnotes:

1. The limits (lbs/day) = total BOD input (lbs/day) / 1000 * NSPS limitations

PART 7 – TBEL CALCULATIONS FOR NATURAL AND PROCESSED CHEESE

pH

Any discharge subject to BPT, BCT, or NSPS limitations or standards in this part must remain within the pH range of 6.0 to 9.0.

New Source Performance Standards (NSPS)

The production process for Cheese commenced construction after May 28th, 1974. Therefore, the NSPS limitations of 40 CFR Part 405.65 apply.

Total BOD Input (lbs/day)	NSPS Effluent Limitations				Calculated Limits			
	BOD (lbs/1,000 lbs)		TSS (lbs/1,000 lbs)		BOD (lbs/day) ¹		TSS (lbs/day) ¹	
	Avg	Max	Avg	Max	Avg	Max	Avg	Max
15,266.86		0.16		0.20		2.4		3.1
13,231.28	0.08		0.10		1.1		1.3	

Footnotes:

1. The limits (lbs/day) = total BOD input (lbs/day) / 1000 * NSPS limitations

PART 8 – TBEL CALCULATIONS FOR CONDENSED WHEY

pH

Any discharge subject to BPT, BCT, or NSPS limitations or standards in this part must remain within the pH range of 6.0 to 9.0.

New Source Performance Standards (NSPS)

The production processes for Whey Protein Concentrate commenced construction after May 28th, 1974. Therefore, the NSPS limitations of 40 CFR Part 405.115 apply.

Total BOD Input (lbs/day)	NSPS Effluent Limitations				Calculated Limits			
	BOD (lbs/1,000 lbs)		TSS (lbs/1,000 lbs)		BOD (lbs/day) ¹		TSS (lbs/day) ¹	
	Avg	Max	Avg	Max	Avg	Max	Avg	Max
6,241.93		0.22		0.276		1.4		1.7
5,409.67	0.11		0.138		0.6		0.7	

Footnotes:

1. The limits (lbs/day) = total BOD input (lbs/day) / 1000 * NSPS limitations

PART 9 – FINAL CALCULATED LIMITS

Per s. NR 240.06(4) Wis. Adm. Code, the total discharge limits shall be the total of the amounts calculated from the BOD input in each of the final product subcategories and all of the other subcategories with intermediate products in Parts 6,7, and 8 of this memo.

For each production line, the most restrictive calculated set of limits are used in the calculation of the final total discharge limits.

Subcategory	Monthly average BOD (lbs/day)	Daily maximum BOD (lbs/day)	Monthly average TSS (lbs/day)	Daily maximum TSS (lbs/day)
Fluid Products	2.0	4.6	2.5	5.8
Natural and Processed Cheese	1.1	2.4	1.3	3.1
Condensed Whey	0.6	1.4	0.6	1.7
Total	3.7	8.4	4.6	10.5

Final Calculated Effluent Limitations			
Parameter & Units	Daily Maximum	Daily Minimum	Monthly Average
BOD ₅	8.4 lbs/day		3.7 lbs/day
TSS	10.5 lbs/day		4.6 lbs/day
pH	9.0 su	6.0 su	